



SOI & ADVANCED SUBSTRATES NEWS
ACCELERATING INDUSTRY GROWTH | Bi-Weekly Newsletter

Share



SOI: Powering AI Efficiency

Our civilization is currently driven by the powerful wave of AI, through the development of advanced large language models and data centers. Energy consumption is a crucial issue among these key enabling technologies. At CEA-Leti, we are convinced that the most powerful lever of improvement lies in energy efficiency: to do more with less energy and resources, SOI once again represents a major solution.

Michaël Tchagaspian
EVP, Technology Strategic Partnerships



FEATURED IN THIS EDITION

EXPLORING 400 GBPS/A AND BEYOND WITH AI-ACCELERATED SILICON PHOTONIC SLOW-LIGHT TECHNOLOGY

This paper proposes AI-accelerated silicon photonic slow-light technology on an SOI platform to overcome modulator limits. This achieves 3.2 Tbps data capacity and 1.6 Tb/s/mm² on-chip density, significantly increasing transmission rates for next-gen optical interfaces.

[Read More](#)

GLOBAL-LOCAL COOPERATIVE OPTIMIZATION IN PHOTONIC INVERSE DESIGN ALGORITHMS

Researchers developed the GLINT algorithm, an inverse design method significantly enhancing computational efficiency and resolution. Utilizing GLINT, they designed and demonstrated ultra-compact photonic devices on SOI wafers, including tiny WDMs and bending waveguides.

[Read More](#)

X-RAY RESIDUAL STRESS MEASUREMENT UNDER NON-IDEAL CONDITIONS USING SILICON-ON-INSULATOR PIXEL DETECTORS

This study applied charge-integration-type silicon-on-insulator (SOI) pixel detectors to X-ray residual stress measurements under non-ideal conditions. It demonstrated the feasibility of stress measurement on curved surfaces and with imperfect diffraction rings, providing insights into the device's applicability to challenging metal products.

[Read More](#)

VOLATILE AND NON-VOLATILE NANO-ELECTROMECHANICAL SWITCHES FABRICATED IN A CMOS-COMPATIBLE SILICON-ON-INSULATOR FOUNDRY PROCESS

This research demonstrates the implementation of monolithically integrated silicon Nanoelectromechanical (NEM) switches using a commercial SOI foundry platform. This significantly removes a barrier to scalable manufacturing of high-performance, high-density NEM-based logic circuits and non-volatile memories.

[Read More](#)

SOI ECOSYSTEM NEWS

AIR LIQUIDE STRENGTHENS ITS ADVANCED MATERIALS LEADERSHIP WITH A NEW MOLYBDENUM MANUFACTURING PLANT IN SOUTH KOREA TO SUPPORT NEXT-GENERATION SEMICONDUCTORS

Air Liquide has launched the world's largest Molybdenum manufacturing plant in South Korea to supply breakthrough Subleem™ advanced materials to semiconductor customers. This enables the industry's shift to molybdenum as a replacement for tungsten in next-gen memory and logic chips for AI applications.

[Read More](#)

1 BILLION MOTOR CONTROL ICS DELIVERED

Elmos Semiconductor SE has reached a major milestone, delivering over 1 billion motor control microchips since production began. Specializing in highly optimized, application-specific ICs, Elmos remains a leading supplier for diverse automotive and other drive systems.

[Read More](#)

EXPLOITING STRAINED EPITAXIAL GERMANIUM FOR SCALING LOW-NOISE SPIN QUBITS AT THE MICROMETRE SCALE

This research tackles noise in semiconductor spin qubits by exploiting low-disorder epitaxial Ge/SiGe heterostructures grown on Ge wafers. It demonstrates low charge noise and enables spin qubit control, providing crucial benchmarks for scaling quantum devices.

[Read More](#)

WAFER-SCALE INTEGRATION OF A-QUARTZ THIN FILMS TOWARD SUPER HIGH FREQUENCY PIEZOELECTRIC BIONEMS FOR CHIKUNGUNYA VIRUS DETECTION

This research develops a large-scale chemical integration of epitaxial α-quartz thin films on silicon wafers to enable wafer-scale piezoelectric α-quartz/silicon bioMEMS. This innovation opens the door for cost-efficient, single-chip, ultrasensitive NEMS sensors for rapid viral diagnostics and other biomedical applications.

[Read More](#)

COMPOUND SEMICONDUCTOR

SINGAPORE OPENS GAN INNOVATION CENTRE

Singapore launched NSTIC (GaN), its first national facility for gallium nitride (GaN) semiconductors, uniquely hosting both 6-inch GaN-on-SiC and 8-inch GaN-on-silicon wafer lines. It offers advanced GaN technology and commercial foundry services from mid-2026, aiming to define the future of high-performance semiconductors.

[Read More](#)

MICROCHIP PARTNERS WITH DELTA ON SIC

Microchip Technology and Delta Electronics have partnered to accelerate the development of SiC-based energy-saving products for AI, mobility, and infrastructure applications. This collaboration leverages SiC's properties for smaller, more efficient designs, driving the adoption of advanced SiC semiconductors.

[Read More](#)

ENHANCED STRESS RELAXATION OF GAN EPILAYERS ON SILICON (1 1 1) SUBSTRATES WITH A UNIQUE ALN/GAN MULTILAYER DESIGN

This study presents a unique AlN/GaN multilayer design to enhance stress relaxation in GaN epilayers on silicon substrates, effectively reducing micro-crack formation. This innovation in compound semiconductor growth on silicon serves as a beneficial template for realizing crack-free III-nitride-based devices.

[Read More](#)

THE IMPACT OF PULSE WIDTH MODULATION ON HEAT ACCUMULATION IN ALGAN CHANNEL HEMTS

New research quantifies heat accumulation in AlGaN channel HEMTs, providing crucial guidelines for optimizing thermal effects and ensuring safe, high-frequency operation in these compound semiconductor devices.

[Read More](#)

SEMI BLOG

SEMI STANDARDS UPDATE: NEW DATA GOVERNANCE GUIDELINES AND SAFETY STANDARD REVISIONS ARE UNDERWAY IN Q2 2025

In Q2 2025, the SEMI International Standards Program achieved significant milestones, including the passing of Document 6938C for equipment data governance and major revisions to EHS standards S2, S8, and S10. The program is also preparing for SEMICON West in Phoenix, featuring a Global Standards Summit on Supply Chain Traceability and Environmental Sustainability, and a dedicated Cybersecurity Forum.

[Read More](#)

SEMI NEWS HIGHLIGHT

SEMI FOUNDATION LAUNCHES NSF-POWERED NATIONAL CALL FOR APPLICANTS OF REGIONAL NODES TO MEET INDUSTRY NEEDS FOR THE U.S. MICROELECTRONICS WORKFORCE

The SEMI Foundation launched the application process for organizations to become Regional Nodes in the National Network for Microelectronics Education (NNME). This nationwide initiative, funded by the U.S. National Science Foundation, aims to advance microelectronics workforce development, supporting up to eight nodes with up to \$20 million each over five years.

[Read More](#)

EVENTS



Thank you for reading this newsletter. For feedback, please email hhoffman@semi.org.

Subscribe